11/09/00 JC685 U.S. PTO

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	197894US2
First Inventor or Application Identifier	Toshihiko ODA
Title	DOCUMENT LINK DESCRIPTION/GENERATION METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT

11/09/00 U.S. PTO 09/708599

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ■ Fee Transmittal Form (e.g. PTO/SB/17) (Submit an original and a duplicate for fee processing)
2. ■ Specification — Total Pages: 14
3. ■ Formal Drawing(s) *(35 U.S.C. 113)* — Total Sheets: 4
4. ■ Oath or Declaration — Total Pages: 3
   a. ■ Newly executed (original or copy)
   b. □ Copy from a prior application *(37 C.F.R. §1.63(d))* *(for continuation/divisional with box 15 completed)*
      i. □F DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see *37 C.F.R. §1.63(d)(2) and 1.33(b).*
5. □ Incorporation By Reference *(usable if box 4B is checked)* The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4B, is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein.

ACCOMPANYING APPLICATION PARTS

6. ■ Assignment Papers (cover sheet & document(s))(3)
7. □ 37 C.F.R. §3.73(b) Statement *(when there is an assignee)* □ Power of Attorney
8. □ English Translation Document *(if applicable)*
9. ■ Information Disclosure Statement (IDS)/PTO-1449 ■ Copies of IDS Citations (2)
10. □ Preliminary Amendment
11. ■ White Advance Serial No. Postcard
12. □ Small Entity Statement(s) □ Statement filed in prior application. Status still proper and desired.
13. ■ Certified Copy of Priority Document(s)(1) *(if foreign priority is claimed)*
14. ■ Other: Application Data Sheet
    Request for Priority
    List of Related Cases

15. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below:*
    □ Continuation □ Divisional □ Continuation-in-part (CIP) of prior application no.:
    Prior application information: Examiner: Group Art Unit:

16. Amend the specification by inserting before the first line the sentence:
    □ This application is a □ Continuation □ Division □ Continuation-in-part (CIP) of application Serial No. Filed on
    □ This application claims priority of provisional application Serial No. Filed

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Docket No. 197894US2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR(S) Toshihiko ODA

SERIAL NO: New Application

FILING DATE: Herewith

FOR: DOCUMENT LINK DESCRIPTION/GENERATION METHOD, APPARATUS AND COMPUTER...

FEE TRANSMITTAL

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FOR	NUMBER FILED	NUMBER EXTRA	RATE	CALCULATIONS
TOTAL CLAIMS	13 - 20 =	0	× $18 =	$0.00
INDEPENDENT CLAIMS	4 - 3 =	1	× $80 =	$80.00
☐ MULTIPLE DEPENDENT CLAIMS (If applicable)			+ $270 =	$0.00
☐ LATE FILING OF DECLARATION			+ $130 =	$0.00
			BASIC FEE	$710.00
			TOTAL OF ABOVE CALCULATIONS	$790.00
☐ REDUCTION BY 50% FOR FILING BY SMALL ENTITY				$0.00
☐ FILING IN NON-ENGLISH LANGUAGE			+ $130 =	$0.00
■ RECORDATION OF ASSIGNMENT			+ $40 =	$40.00
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Respectfully Submitted,

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Application Information

Title: DOCUMENT LINK DESCRIPTION/GENERATION METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT

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Docket #197894US2

TITLE OF THE INVENTION

DOCUMENT LINK DESCRIPTION/GENERATION METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT

CROSS-REFERENCE TO RELATED DOCUMENTS

The present document claims priority on and contains subject matter related to Japanese Patent Application No. 11-317688 filed in the Japanese Patent Office on November 9, 1999, and the entire contents of which are hereby incorporated herein by reference.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to a document link description method, a document link generating apparatus, and a computer program product, that realize a plurality of document links by describing one abstract link.

Discussion of the Background

In the present specification, an electronic document edited and created on a computer and stored in a storage medium is referred to as a document. Generally, documents, not only paper documents but also electronic documents, contain information having an internal structure, such as, for example, a hierarchical structure constituted by logical elements, such as, chapters and verses. In a hypertext document description language, such as a SGML (Standard Generalized Markup Language), an XML (Extensible Markup Language), or a HTML (Hypertext Markup Language), each logical element is expressed by a tag. Particularly, in the XML, a peculiar document type (i.e., a document structure rule) can be easily defined for each document class, and further, recognition of the document structure and extraction of the document information can be easily realized by a document processing program.

In a hypertext document, information for linking a document to another document is described within each document using one of the above-described document description languages. A user can refer to and read related information in a plurality of documents using a browser that has a function to update the display of a computer to a linking destination

document from the displayed document.

Conventionally, when defining a document link in a hypertext document description language, such as the XML or the HTML, the location information of a document element desired to be linked, such as the location of a file of a document including the document element, the name of the document element, and the structural position of the document element in the document, is described at a link source document element. That is, such location information of a linking destination is described for each link.

For example, when defining a link for a technical term in a document to a description sentence in a technical term dictionary, the location information of the linking destination (i.e., the name of the dictionary and the position of the technical term in the dictionary) must be described for each appearance of the technical term in the document. This creates a problem that repetitive operations for describing the linking information are necessary for a document and also creates a problem that the size of the document is increased because of the added linking information. In addition, when the document at the linking destination is changed, for example when the structure or the location of the document is changed, the description of the linking information has to be changed accordingly, which is also troublesome.

SUMMARY OF THE INVENTION

The present invention has been made in view of the above-discussed and other problems and addresses the above-discussed and other problems.

Preferred embodiments of the present invention provide a novel document link description method, apparatus, and computer program product, that reduces labor in describing a document link and that reduces the size of a link description document file.

According to a preferred embodiment of the present invention, a method of describing a document link for linking a first document of a link source and a second document of a linking destination includes a step of describing an abstract link in the first document of the link source. The abstract link describes a link establishing condition for determining the document link between the first document of the link source and the second document of the linking destination on a basis of retrieval of document information of the first document of the link source and the second document of the linking destination.

According to the present invention, the abstract link may describe the nature of document elements of the first document of the link source and the second document of the linking destination according to a Horn clause predicate expression.

Further, the abstract link may derive the document elements of the first document of the link source and the second document of the linking source satisfying the link establishing condition on a basis of a backtrack evaluation and a calculation to bind a variable based upon the document information retrieval.

Furthermore, the abstract link may be described using an atom predicate.

According to another preferred embodiment of the present invention, a document link generating apparatus for linking a first document of a link source and a second document of a linking destination includes an abstract link extracting device configured to extract, from the first document of the link source, an abstract link describing a link establishing condition for determining the document link between the first document of the link source and the second document of the linking destination on a basis of retrieval of document information of the first document of the link source and the second document of the linking destination. Also, a document link generating device generates the document link based upon the extracted abstract link.

In the above-described apparatus, the abstract link may describe the nature of document elements of the first document of the link source and the second document of the linking destination according to a Horn clause predicate expression.

Further, the abstract link may derive the document elements of the first document of the link source and the second document of the linking destination satisfying the link establishing condition on a basis of a backtrack evaluation and calculation to bind a variable based upon the document information retrieval.

Furthermore, the abstract link may be described using an atom predicate.

According to still another preferred embodiment of the present invention, a computer program product includes a computer storage medium and a computer program code mechanism embedded in the computer storage medium for causing a computer to control linking a first document of a link source and a second document of a linking destination. The computer program code mechanism includes a first computer code device configured to extract, from the first document of the link source, an abstract link describing a link

establishing condition for determining the document link between the first document of the link source and the second document of the linking destination on a basis of retrieval of document information of the first document of the link source and the second document of the linking destination. Also, a second computer code device is configured to generate the document link based upon the extracted abstract link.

Accordingly, according to the present invention, a description of a plurality of document links is realized by describing only one abstract link, and thereby the labor of describing the document link is reduced and the size of a document link description file is reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete appreciation of the present invention and many of the attendant advantages thereof will be readily obtained as the same becomes better understood by reference to the following detailed description when considered in conjunction with accompanying drawings, wherein:

Fig.1 is a block diagram illustrating a hardware construction of a document processing apparatus according to a preferred embodiment of the present invention;

Fig. 2 is a diagram illustrating an outline of a process performed by the document processing apparatus;

Fig. 3 is a flowchart illustrating an exemplary process of analyzing a document link described with an abstract link; and

Figs. 4, 5, and 6 are diagrams illustrating exemplary document files for explaining a document linking operation of the document processing apparatus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, preferred embodiments of the present invention are described.

Fig. 1 is a block diagram illustrating a hardware construction of a document processing apparatus 1 according to a preferred embodiment of the present invention. The document processing apparatus 1 functions as a document link generating device to generate

a document link. As illustrated in Fig. 1, the document processing apparatus 1 includes a CPU 2, a ROM 13, which is a read-only memory storing a BIOS, and a RAM 3, which stores various data in a writable manner and which serves as a working area for the CPU 2, respectively connected with each other via a bus 4. A secondary storage device 5, e.g. a hard disk, a display 6, a keyboard 7, a mouse 8, a communication controller 9 for connecting the document processing apparatus 1 to a network 9, and a CD-ROM drive 11 are also connected to the bus 4 via suitable interfaces.

In the second storage device 5, an abstract link evaluation program 51, a document information access program 52, and a document reading program 53 are stored. These programs are stored in a CD-ROM 12, which is readable with the document processing apparatus 1 via the CD-ROM drive 11, and are loaded to the secondary storage device 5 from the CD-ROM 12. As a storage medium for storing these programs, various media other than the CD-ROM 12, for example, a DVD, a FD, an optical magnetic disk, and other media, can be used. Also, the above-described programs can be down-loaded from a network, such as the Internet, so as to be installed into the secondary storage device 5. In this case, the storage medium of a storage device connected to the network at the transmitting side and storing therein the above-described programs also constitutes a computer program product according to the present invention.

The document information access program finds documents in the secondary storage device 5 or documents accessible via the network 9, reads out the content information of the documents, and extracts the document elements which are designated. The abstract link evaluation program 51 analyzes the abstract link described in an abstract link description file 54 to search the document elements with the document information access program 53, and thereby generates a document link between the documents. The document reading program 53 is a browser for reading a hypertext document in an efficient manner. Each of the above-described programs may operate on a predetermined OS.

Fig. 2 is a diagram illustrating the outline of a process performed by the document processing apparatus 1. As illustrated in Fig. 2, a document link processed by the document processing apparatus 1 is called an abstract link and in the process the locations of a link source file 21 and a linking destination file 22 are not described as in the conventional document link. Instead, the abstract link describes a link establishing condition for

determining a document link based upon the document information retrieved from the link source file 21 and the linking destination file 22. The link establishing condition is described in a Horn clause predicate expression described later. When the document link information is needed, for example in reading a document, the abstract link in a document describing the abstract link (i.e., an abstract link description file 54) is read by a process according to the abstract link evaluation program 51, and the document elements of the link source file 21 and the linking destination file 22 satisfying the link establishing condition described in the abstract link are derived from the backtrack evaluation and the document information retrieval. Thereby, the document elements, which are linked with each other as a linking destination and a link source, are determined, and the document link linking the documents elements is generated.

Next, the role and the method of expressing a document link herein referred to as the abstract link are described. Because the abstract link uses an atom predicate, first the atom predicate is described and then the link establishing condition and the abstract link are described.

In the abstract link, the expression method referred to as a predicate expression is used, in which the nature and the relation of a substance are described. Namely, the information about a document and the information about the logical element of the document are described using the predicate expression. The information about a document includes, for example, the document name, the attribute of the document defined in the document, and so forth.

The atom predicate constitutes the main element in the predicate expression. The atom predicate is a finite character row (a predicate) followed by the N (N is an integer not less than 1) number of arguments (constant, variable or function) which are enclosed in parenthesis. An example of the atom predicate is shown below, in which "document name" is the predicate and the variable $x (wherein the alphabetic letter following $ is the variable) and the constant "abc.XML" are the arguments.

document name ($x, "abc.XML") .. (1)

The available kinds of the predicate are dependent on the specification of the document description language. For example, in the XLM document description language, in which a tag expression called XML is used, an XML document is constructed by the

hierarchical document elements. Further, the document elements have respective names, and can have a plurality of attributes. A representative predicate in the XML document is described below with each definition. A variable or a constant is given as the argument.

Document (a) : "a" is a reference to the substance of a document.

DocumentLocation (a, b) : The location of the document reference "a" is "b".

DocumentName (a, b) : The name of the document reference "a" is "b".

DocumentElement (a, b) : "b" is a reference to the substance of the logical element included in the document reference "a".

DocumentElementName (a, b): The name of the logical element reference "a" is "b".

DocumentAttribute (a, b, c) : The attribute "b" of the logical element reference "a" has the attribute value "c".

RouteElement (a, b) : The logical element reference at a highest rank of the document "a" is "b".

ChildElement(a, b) : The logical element at a lower rank of the logical element "a" is "b".

When two or more atom predicates are arranged with a symbol $\wedge$, the logical connection exists between the atom predicates sandwiching the symbol $\wedge$. Further, the Horn clause includes one atom predicate in the left side of a symbol "$\leftarrow$" and the logical connection of the atom predicates in the right side of the symbol. For example, if p, q, r are the atom predicates respectively, the following formula (2) constitutes the Horn clause:

$p \leftarrow q \wedge r$ ... (2).

The link establishing condition describes the document elements which are related to each other via a link, using the Horn clause. The link establishing condition includes two Horn clauses, describing the link establishing condition for the link source element and the linking destination element, respectively. An example of the link establishing condition is described below. In the example, two Horn predicates are included, and the formula (3) expresses the link source element and the formula (4) expresses the linking destination element.

link source element ($y)$\leftarrow$

Document ($x) $\wedge$ DocumentName ($x, "abc.XML") $\wedge$

DocumentElement ($x, $y) $\wedge$ DocumentElementName ($y, "PPP") ... (3)

linking destination element ($b)←

Document ($a) ∧ DocumentName ($b, "xyz.XML") ∧

DocumentElement ($a, $b) ∧ DocumentElementName ($b, "QQQ") ... (4)

What is meant by the above formulas (3) and (4) is that the document link is established between the document element which is included in the document with the name of "abc.XML" and which has the name of "PPP", and the document element which is included in the document with the name of "xyz. XML" and which has the name of "QQQ". The abstract link is a description of a document link including such a link establishing condition as described above.

Fig. 3 is a flowchart illustrating an exemplary process of analyzing the document link described using the abstract link. The process is activated, for example, when reading a hypertext using the document reading program.

First, the abstract link description file 54 as a document file describing the abstract link is read such that the abstract link included in the abstract link description file 54 is extracted (step S1), by which a document link extracting device and a document link extracting step are realized.

Next, an abstract link evaluation process is executed on the abstract link description file 54 (step S2), by which the document information is retrieved on the basis of the link establishing condition, and each set of the document elements of the linking destination and the link source is derived. The basic operation of this process is similar to the one in the logical type program language processing system on the basis of the Horn clause. In the logical type program language processing system, a process, the main part of which is constituted of pattern matching and backtrack evaluations, is performed. However, the pattern matching processing part of the above process of the abstract link evaluation program differs from that in the logical type program language processing system.

The reason is that in the logical type program language processing system, factual data is also described in the predicative expression and therefore can be treated as a predicate pattern, but in the abstract link evaluation process, the factual data is the information about a document or the content of the document existing in a storage device and is not described in the predicative expression and therefore cannot be treated as a predicate pattern. Accordingly, for each kind of the predicates used in the abstract link, a sub-routine for

retrieving the document information so as to compare the document information with the predicate is given, and using this sub-routine, the comparison of a predicate and factual data and the variable binding are performed. That is, in the process of the abstract link evaluation program, the link establishing condition is constituted of a backtrack evaluation and a calculation for binding a variable on the basis of document information retrieval.

Then, the document link is defined on the basis of the power set of the document element sets of the linking destination and the link source derived in step S2 (step S3), by which a document link generation step and a document link generation step are realized. When the abstract links are plural (Yes in step S4), the processes of steps S2 and S3 are repeated a plurality of times.

As described above, an abstract link description file 54 is made so as to express a document link by describing an abstract link, describing a link establishing condition for determining a document link to link a document file of a link source with a document file of a linking destination on the basis of retrieval of the document information of both document files, in the abstract link description file 54. Further, the abstract link description file 54 is made such that the abstract link describes the nature of the document elements of the documents files of the link source and the linking destination according to the Horn clause predicative expression. Furthermore, the abstract link description file 54 is made so as to derive the document elements of the documents files of the link source and the linking destination on the basis of backtrack evaluation and calculation to bind a variable on the basis of document information retrieval. The abstract link is described using an atom predicate.

An exemplary linking operation is now described referring to three documents files illustrated in Figs. 4 to 6. The three documents are described with the XML, one of the document description languages for expressing a document with a tag. In the examples, the definition of a document link from a keyword appearing in a document illustrated in Fig. 5 to a corresponding term explanation in a document illustrated in Fig. 6 is made by an abstract link description file illustrated in Fig. 4. Conventionally, a document link to a corresponding term explanation is described for each keyword. However, according to the above-described embodiment of the present invention, only one abstract link is described.

Then, by calculation of the combination of variable substitution satisfying the link establishing condition with the abstract link evaluation program, the following three

combinations of variable substitution are obtained:

substitution example 1: {$keyword="XML", $y=p1, $B=q1};

substitution example 2: {$keyword="XML", $y=p2, $B=q1};

substitution example 3: {$keyword="predicate expression", $y=p3, $B=q2}.

As a result, the three links, one from p1 to q1, another from p2 to q1, and still another from p3 to q2, are derived.

The mechanism and processes set forth in the present description may be implemented using a conventional general purpose microprocessor programmed according to the teachings in the present specification, as will be appreciated to those skilled in the relevant art. Appropriate software coding can be readily prepared by skilled programmers based upon the teachings of the present disclosure, as will also be apparent to those skilled in the art.

The present invention thus also includes a computer program which may be hosted on a storage medium and which includes instructions which can be used to program a microprocessor to perform a process in accordance with the present invention. The storage medium can include, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, magneto-optical disks, ROMs, RAMs, EPROMs, EEPROMs, flash memory, magnetic or optical cards, or any type of media suitable for storing electronic instructions.

Numerous additional modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the present invention may be practiced otherwise than as specifically described herein.

Claims:

1. A method of describing a document link for linking a first document of a link source and a second document of a linking destination, the method comprising a step of:

describing an abstract link in the first document of the link source, the abstract link describing a link establishing condition for determining a document link between the first document of the link source and the second document of the linking destination on a basis of retrieval of document information of the first document of the link source and the second document of the linking destination.

2. A method of Claim 1, wherein the abstract link describes a nature of document elements of the first document of the link source and the second document of the linking destination according to a Horn clause predicate expression.

3. A method of Claim 1, wherein the abstract link derives document elements of the first document of the link source and the second document of the linking source documents satisfying the link establishing condition on a basis of a backtrack evaluation and a calculation to bind a variable based upon the document information retrieval.

4. A method of Claim 1, wherein the abstract link is described using an atom predicate.

5. A document link generating apparatus for linking a first document of a link source and a second document of a linking destination, comprising:

an abstract link extracting device configured to extract, from the first document of the link source, an abstract link describing a link establishing condition for determining a document link between the first document of the link source and the second document of the linking destination on a basis of retrieval of document information of the first document of the link source and the second document of the linking destination; and

a document link generating device configured to generate the document link based upon the extracted abstract link.

6. An apparatus of Claim 5, wherein the abstract link describes a nature of document elements of the first document of the link source and the second document of the linking destination according to a Horn clause predicate expression.

7. An apparatus of Claim 5, wherein the abstract link derives document elements of the first document of the link source and the second document of the linking destination satisfying the link establishing condition on a basis of a backtrack evaluation and a calculation to bind a variable based upon the document information retrieval.

8. An apparatus of Claim 5, wherein the abstract link is described using an atom predicate.

9. A document link generating apparatus for linking a first document of a link source and a second document of a linking destination, comprising:

means for extracting, from the first document of the link source, an abstract link describing a link establishing condition for determining a document link between the first document of the link source and the second document of the linking destination; and

means for generating the document link based upon the extracted abstract link.

10. A computer program product, comprising:

a computer storage medium and a computer program code mechanism embedded in the computer storage medium for causing a computer to control linking a first document of a link source and a second document of a linking destination, the computer program code mechanism comprising:

a first computer code device configured to extract, from the first document of the link source, an abstract link describing a link establishing condition for determining a document link between the first document of the link source and the second document of the linking destination on a basis of retrieval of document information of the first document of the link source and the second document of the linking destination; and

a second computer code device configured to generate the document link based upon

the extracted abstract link.

11. A computer program product of Claim 10, wherein the abstract link describes a nature of documents elements of the first document of the link source and the second document of the linking destination according to a Horn clause predicate expression.

12. A computer program product of Claim 10, wherein the abstract link derives document elements of the first document of the link source and the second document of the linking destination satisfying the link establishing condition on a basis of a backtrack evaluation and a calculation to bind a variable based upon the document information retrieval.

13. A computer program product of Claim 10, wherein the abstract link is described using an atom predicate.

ABSTRACT OF THE DISCLOSURE

An operation of describing a document link for linking a first document of a link source and a second document of a linking destination. An abstract link is described in the first document of the link source, and the abstract link describes a link establishing condition for determining the document link between the first document of the link source and the second document of the linking destination on a basis of a retrieval of document information of the first document of the link source and the second document of the linking destination.

09/065,536 - 4/6/98

FIG. 1

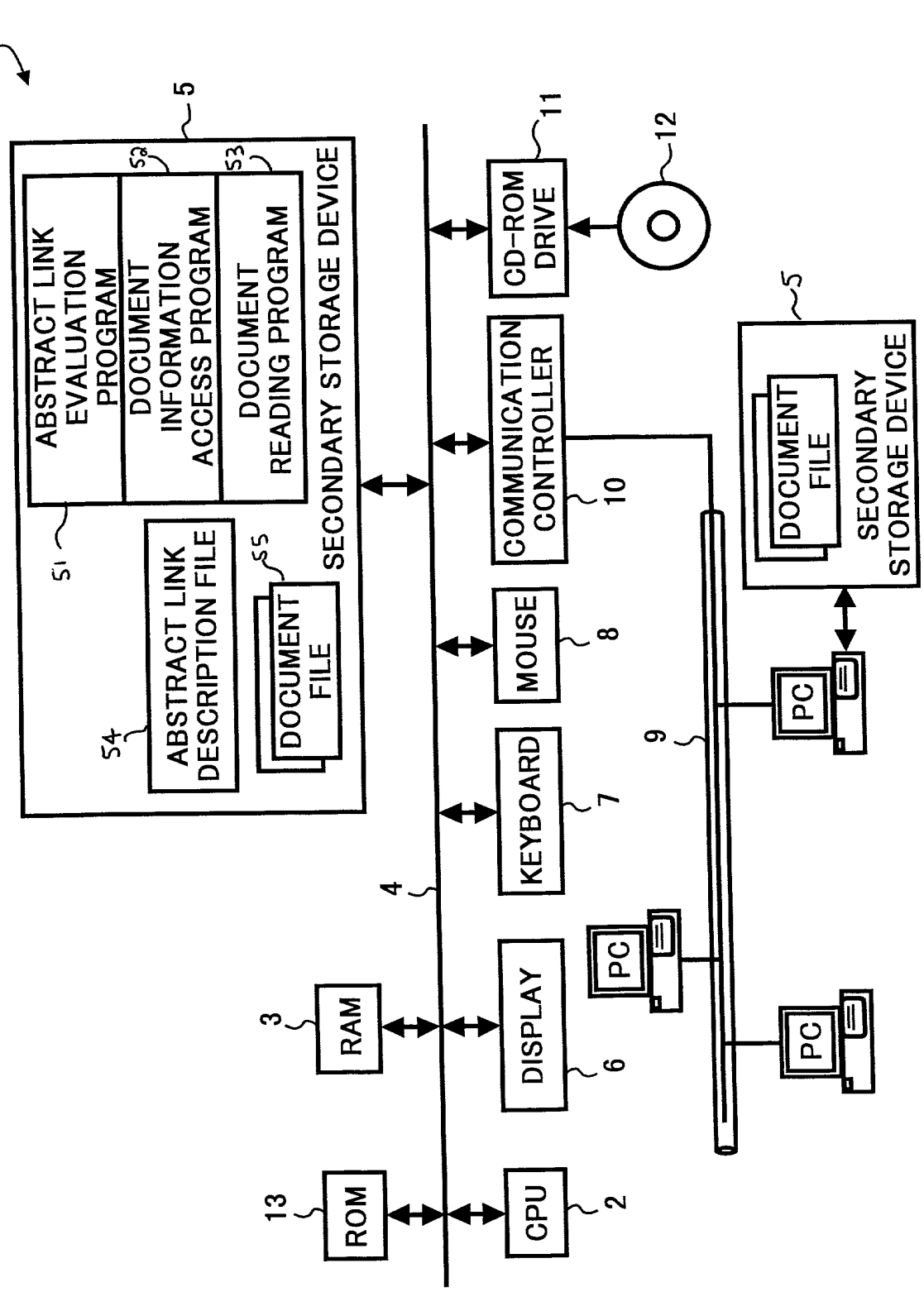

1
5
ABSTRACT LINK EVALUATION PROGRAM
DOCUMENT INFORMATION ACCESS PROGRAM
DOCUMENT READING PROGRAM
SECONDARY STORAGE DEVICE
51
52
53
54
ABSTRACT LINK DESCRIPTION FILE
55
DOCUMENT FILE
CD-ROM DRIVE
11
12
COMMUNICATION CONTROLLER
10
MOUSE
8
KEYBOARD
7
4
RAM
3
DISPLAY
6
ROM
13
CPU
2
9
PC
PC
PC
5
DOCUMENT FILE
SECONDARY STORAGE DEVICE

FIG. 2

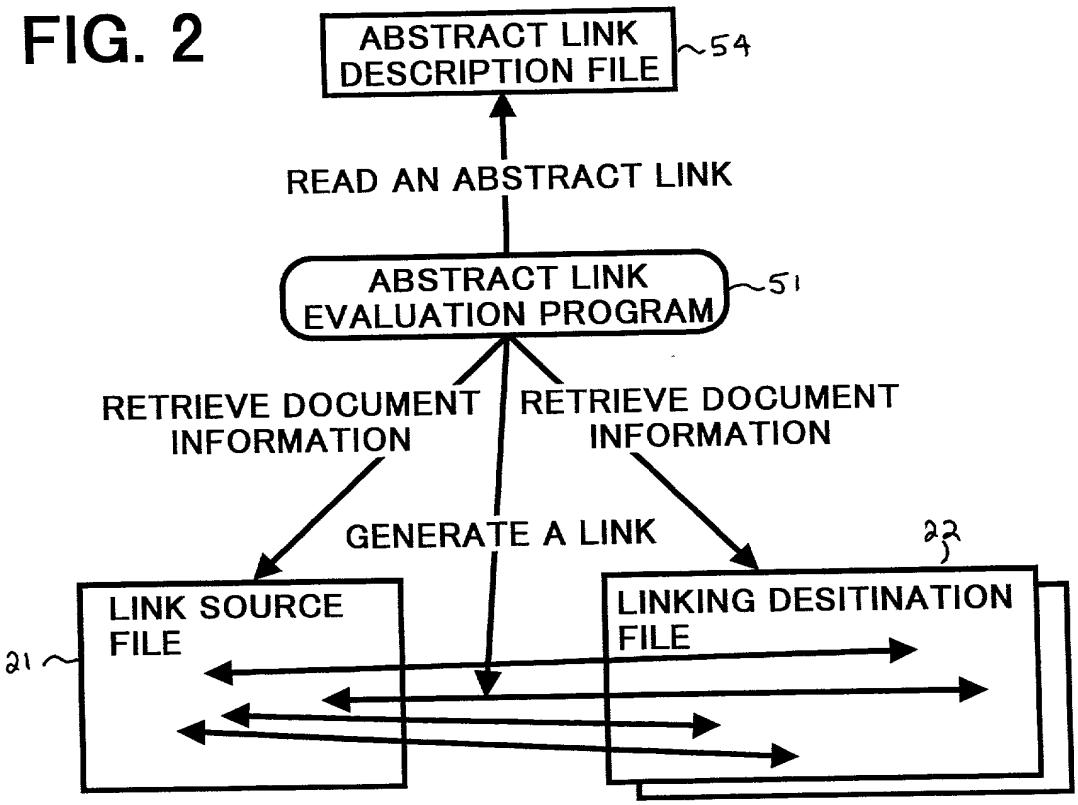
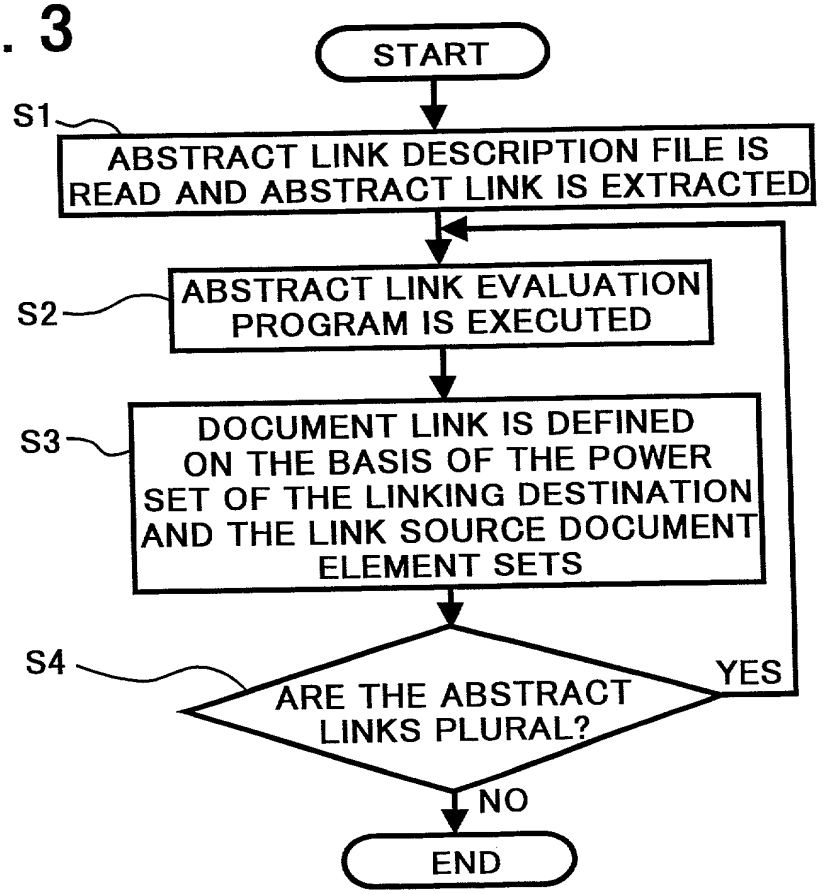

ABSTRACT LINK DESCRIPTION FILE
54
READ AN ABSTRACT LINK
ABSTRACT LINK EVALUATION PROGRAM
51
RETRIEVE DOCUMENT INFORMATION
RETRIEVE DOCUMENT INFORMATION
GENERATE A LINK
22
LINK SOURCE FILE
21
LINKING DESITINATION FILE

FIG. 3


START
S1
ABSTRACT LINK DESCRIPTION FILE IS READ AND ABSTRACT LINK IS EXTRACTED
S2
ABSTRACT LINK EVALUATION PROGRAM IS EXECUTED
S3
DOCUMENT LINK IS DEFINED ON THE BASIS OF THE POWER SET OF THE LINKING DESTINATION AND THE LINK SOURCE DOCUMENT ELEMENT SETS
S4
ARE THE ABSTRACT LINKS PLURAL?
YES
NO
END

D0607F "65580760

OBLON, SPIVAK, ET AL
DOCKET #: 197894US2
INV: Toshihiko ODA
SHEET 3 OF 4

FIG. 4

```
<AbstractLink Role=term explanation>
<link establishing condition>
 link source element ($y)←
    Document ($x)∧DocumentLocation ($x,"./")∧Document-
    Name ($x,"invention application document.txt")∧
    DocumentElement ($x,$y)∧DocumentElementName
    ($y,"keyword")∧
    DocumentElementAttribute ($y,"name",$keyword)
 link destination element ($b)←
    Document ($a)∧DocumentLocation ($a,"../doc/")∧Document-
    Name ($a,"term dictionary.txt")∧DocumentElement ($a, $y)
    ∧DocumentElementName ($b,"term item")∧DocumentElement
    Attribute ($b,"term name",$keyword)
</link establishing condition>
</AbstractLink>
```

FIG. 5

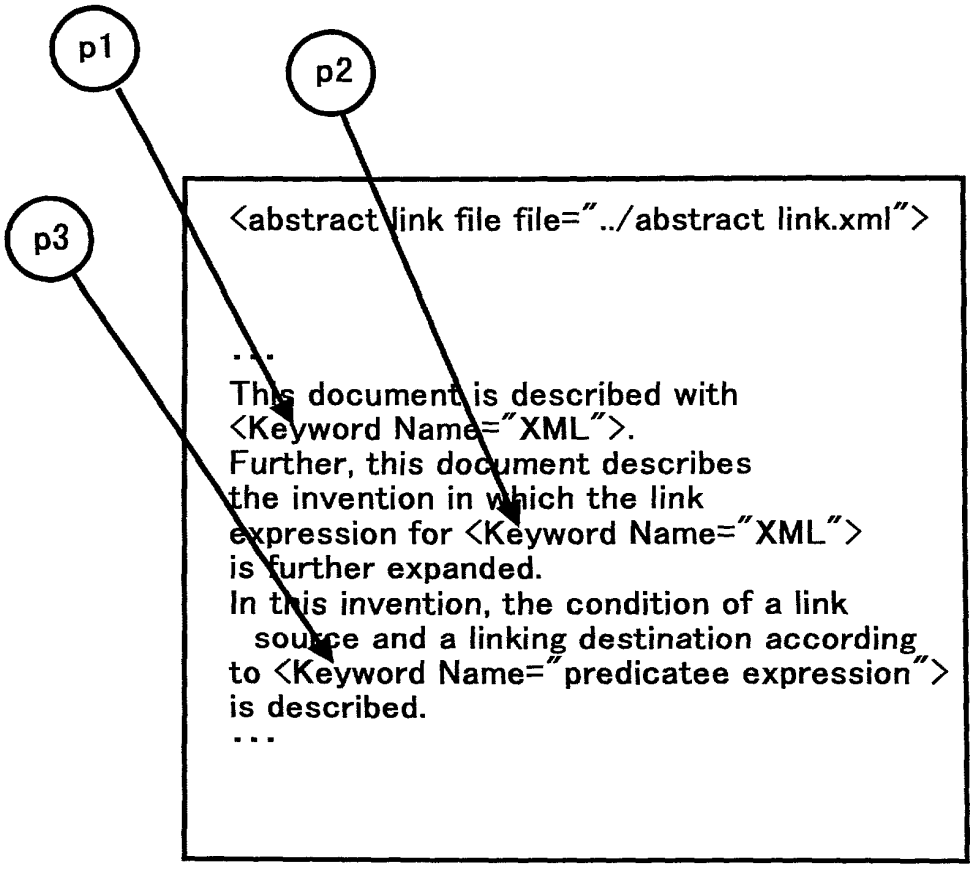
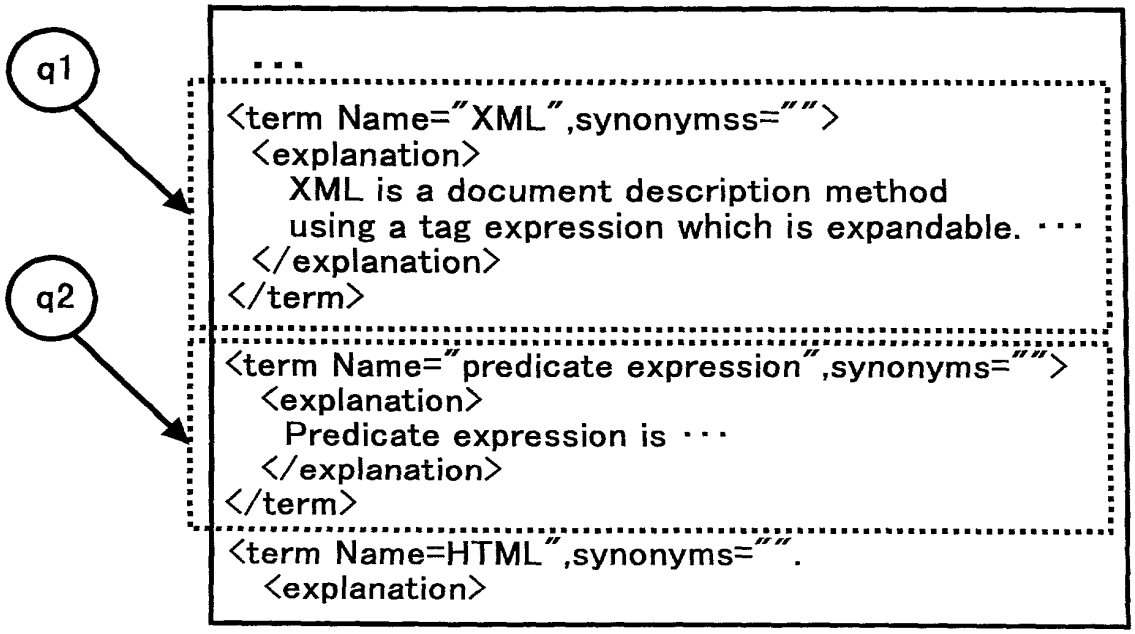

p1
p2
p3
<abstract link file file="../abstract link.xml">
...
This document is described with
<Keyword Name="XML">.
Further, this document describes
the invention in which the link
expression for <Keyword Name="XML">
is further expanded.
In this invention, the condition of a link
source and a linking destination according
to <Keyword Name="predicatee expression">
is described.
...

FIG. 6


q1
q2
...
<term Name="XML",synonymss="">
<explanation>
XML is a document description method
using a tag expression which is expandable. ...
</explanation>
</term>
<term Name="predicate expression",synonyms="">
<explanation>
Predicate expression is ...
</explanation>
</term>
<term Name=HTML",synonyms="".
<explanation>

Declaration and Power of Attorney For Patent Application

特許出願宣言書及び委任状

Japanese Language Declaration

日本語宣言書

下記の氏名の発明者として、私は以下の通り宣言します。

As a below named inventor, I hereby declare that:

私の住所、私書箱、国籍は下記の私の氏名の後に記載された通りです。

My residence, post office address and citizenship are as stated next to my name.

下記の名称の発明に関して請求範囲に記載され、特許出願している発明内容について、私が最初かつ唯一の発明者（下記の氏名が一つの場合）もしくは最初かつ共同発明者（下記の名称が複数の場合）であると信じています。

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled.

DOCUMENT LINK DESCRIPTION/GENERATION METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT

上記発明の明細書は、

the specification of which

☐ 本書に添付されています。

☒ is attached hereto.

☐ ___月___日に提出され、米国出願番号または特許協定条約国際出願番号を_____とし、（該当する場合）_____に訂正されました。

☐ was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

Attorney's Docket 197894US2

私は、特許請求範囲を含む上記訂正後の明細書を検討し、内容を理解していることをここに表明します。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37編第1条56項に定義されるとおり、特許資格の有無について重要な情報を開示する義務があることを認めます。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

Japanese Language Declaration
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私は、米国法典第35編119条（a）-（d）項又は365条（b）項に基づき下記の、米国以外の国の少なくとも一ヵ国を指定している特許協力条約365（a）項に基づく国際出願、又は外国での特許出願もしくは発明者証の出願についての外国優先権をここに主張するとともに、優先権を主張している、本出願の前に出願された特許または発明者証の外国出願を以下に、枠内をマークすることで、示しています。

I hereby claim foreign priority under Title 35, United States Code, Section 119 (a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or Section 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)
外国での先行出願

(Number) (番号)	(Country) (国名)	(Day/Month/Year Filed) (出願年月日)	Priority Claimed 優先権主張 Yes はい	No いいえ
11-317668	JAPAN	November 9, 1999	☒	☐
			☐	☐

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(Application No.) (出願番号)	(Filing Date) (出願日)

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(Application No.) (出願番号)	(Filing Date) (出願日)	(Status: Patented, Pending, Abandoned) (現況：特許許可済、係属中、放棄済)

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Japanese Language Declaration
(日本語宣言書)

委任状：私は下記の発明者として、本出願に関する一切の手続きを米特許商標局に対して遂行する弁理士または代理人として、下記の者を指名いたします。
(弁護士、または代理人の指名及び登録番号を明記のこと)

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